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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,925	07/07/2003	Takahiro Kawano	239801US2	6929
22850	7590	11/03/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.			NADAV, ORI	
1940 DUKE STREET			ART UNIT	
ALEXANDRIA, VA 22314			PAPER NUMBER	
			2811	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/612,925	Applicant(s) KAWANO ET AL.	
	Examiner ori nadav	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,7-20 and 25-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-6,21-24 and 39-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/2/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of the embodiment of figure 8 in the reply filed on 10/1/2004 is acknowledged. The traversal is on the ground(s) that a search and examination of the entire application would not place a serious burden on the examiner, because electronic searching can be made of a large number of/ or theoretically all, subclasses without substantial additional effort. This is not found persuasive because applicant's hypotheses that electronic searching can be made of a large number of/ or theoretically all, subclasses without substantial additional effort is incorrect since searching through thousands of references related to the patentable distinct inventions place a serious burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because figure 8 does not include reference sign 801 mentioned in the description. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

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Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figures 20-26 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1, 4-6, 21-24 and 39-41 are objected to because of the following informalities: Claims 1, 6 and 24 recite the limitation "the uppermost" in lines 12, 19 and 30, respectively. There is insufficient antecedent basis for this limitation in the claim.

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The claimed limitation of "main electrodes and upper surfaces of the main electrodes" should read "main electrodes, and upper surfaces of the main electrodes".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4-6, 21-24 and 39-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Figure 8 depict gate wiring 108 being higher than the upper surfaces of the main electrodes. Therefore, there is no support in the disclosure for a device comprising upper surfaces of the main electrodes being higher than an upper surface of the uppermost layer of the gate wiring, as recited in claims 1, 6 and 24.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 4-6, 21-24 and 39-41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claimed limitation of an uppermost layer of the gate wiring, as recited in claims 1, 6 and 24, is unclear as to which layer is the uppermost layer.

The claimed limitations of a gate electrode which controls continuity/non-continuity, as recited in claims 6 and 24, are unclear as to whether the gate electrode controls continuity or non-continuity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 21-24 and 39-41, insofar as in compliance with 35 U.S.C. 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Narazaki et al. (6,285,058) in view of Applicant Admitted Prior Art (AAPA).

Narazaki et al. teach in figure 1 and related text a semiconductor device comprising:

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a semiconductor layer which includes a first semiconductor region 2 of a first conductivity type, a base region 3 of a second conductivity type, and a plurality of second semiconductor regions 5 (see figure 3) of the first conductivity type;

a gate wiring 10 which is formed on the semiconductor layer via a first insulating film 4;

a plurality of main electrodes 14 (see figure 2) which are electrically connected to the plurality of second semiconductor regions and which are insulated from the gate wiring, wherein the gate wiring is arranged between the main electrodes, and upper surfaces of the main electrodes 14 are higher than an upper surface of the uppermost layer of the gate wiring.

Narazaki et al. do not teach a connecting plate which is directly connected onto uppermost layers of the main electrodes.

AAPA teaches in figure 21 a connecting plate is directly connected onto uppermost layers of the electrodes of the device.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to connect a connecting plate directly onto the uppermost layers of the electrodes of Narazaki et al.'s device in order to provide good connection between the source electrodes and the external wirings.

Regarding claims 4, 21-23 and 39-41, AAPA teaches gate wiring 2107 comprising aluminum, and a connecting plate connected to a lead frame. It would have been obvious to a person of ordinary skill in the art at the time the

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invention was made to form the main electrodes and the connecting plate of a plurality of metal layers comprising aluminum and to connect the connecting plate to a lead frame in Narazaki et al.'s device in order to reduce the contact resistance between the main electrodes and the lead frame and in order to provide external connections to the device.

Regarding claim 4, Narazaki et al. teach a second insulating film extends between plurality of metal layers.

Regarding claim 5, Narazaki et al. teach in figure 1 plurality of main electrodes are formed apart from the gate wiring with a gap there between.

Regarding the process limitations recited in claims 23 and 41 ("the first connecting plate is connected to the first main electrode and the second main electrode by ultrasonic bonding") these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be

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determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Regarding claims 6 and 24, Narazaki et al. teach a first gate electrode 7 (see figure 5) which is formed in the cell forming region and controls continuity/non-continuity between the first semiconductor region and the second semiconductor region; and a plurality of main electrodes which are electrically connected to the plurality of second semiconductor regions respectively and which are formed at predetermined intervals in the cell forming region on the semiconductor layer.

Regarding claim 24, Narazaki et al. teach a second semiconductor layer 3 of a second conductivity type which is formed on the first semiconductor layer²; first and second semiconductor regions 5 (see figure 3) of the first conductivity type which is formed in first and second cell forming regions in the second semiconductor layer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference B is cited as being related to upper surfaces of main electrodes being higher than an upper surface of the uppermost layer of the gate wiring .

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Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is (571) 272-1660. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

O.N.
11/1/04



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PRIMARY EXAMINER
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